
Design Fiction Film-Making: A Pipeline for Communicating Experiences

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Abstract

The use of films in early stages of the design of technology is a practice that is becoming increasingly common. However, the focus of these films is usually centred on exploring the technology and its specifications rather than on the experiences that the technology can potentially create for its user. Previous research emphasises the relevance of experiences created by the technology in the users arguing that the emotions should be taken into account during early design stages and made part of the design itself. In this paper we provide a step-by-step production pipeline on how to make your own design fiction film, and how you can get the experiences across. For this purpose we focus on the experiences and emotions that a specific interaction medium elicits. We gained inspiration from the increased exploration of olfactory experiences in HCI. We used a classification of smell experiences as a starting point to produce a design fiction film for the automotive context, not limited by technology but inspired by experiences.

Author Keywords

Design fiction; Experience design; Film production; Olfactory experiences; Smell; Automotive context

ACM Classification Keywords

H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous

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CHI'16, May 7-12, 2016, San Jose, California.
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Introduction and Related Work

The use of film in early stages of the design of technology is a practice that is becoming increasingly common [2, 3, 9, 13]. Films in HCI initially focused on video prototyping and had the purpose of evaluating user interfaces mock-ups, for instance [18, 15]. Although this practice is still in use today, the use of film is expanding and changing purpose, especially thanks to the proposal by Sterling [14] of using fiction as a design tool in HCI.

Films are perfect tools for conveying fictional worlds to an audience and elicit reactions from them. An example of this is the work of Briggs et al. [2, 3], which is inspired by the way monsters were hidden from the audience's view in the early years of horror cinema, and adapts the monster non-representation to design by proposing a non-commitment approach to the physical design of the technology, thus leaving user groups free to discuss the physical appearance and functionalities of the technology.

Buchenau and Suri [4] introduce the concept of Experience Prototyping, defining it as *“any kind of representation, in any medium, that is designed to understand, explore or communicate what it might be like to engage with the product, space or system we are designing”* ([4], page 425). Hassenzahl [8] and McCarthy and Wright [10] also argue that the emotions that the technology can elicit in its users should be taken into account during early design stages, made explicit, and incorporated in the design itself. This influences how films for design are being produced, for example Mancini et al. [9] focus their video on the positive and negative attitudes of the user toward technology and on their consequences, with the purpose of eliciting different reactions and discussions in user groups.

Although the approaches to design using films taken in the previous works are successful in stimulating user groups

discussions, they miss the opportunity to emphasise the implications of technology on the users lifestyle and experiences.

As an experienced team in making design fiction and research dissemination films, we aim to formalise our production process in this paper so that it can be used by other researchers and practitioners in their early exploration of future interactive experiences. This formalisation takes the form of a production pipeline that incorporates the experiences that technology could elicit in its users and the changes in their lifestyle.

Some elements of the HCI prototyping practice are related to some of the stages of the filming pipeline, for instance the character design and the use of persona during prototyping [17, 7] are very similar as is the generation of scenarios and scripts and the storyboarding practice. However, some differences need to be pointed out. The character design for the film and the script are more developed than the character persona and scenarios used in HCI. Character design and scripts need to take into account the lifestyle the character is living, and the detailed interaction with the environment in which they live. Our approach aligns with the work of Blythe et al. [1] who argue to use characters from literature to create persona as they are already deeply developed in the collective imagination of the audience. Our approach involved developing characters more deeply than just a persona and developing a detailed script rather than a scenario. However, we chose not to use fictional literature characters as this may cause copyright issues with the authors of the characters. The storyboards also are more complex than the storyboards used in HCI as they need to convey information about camera movements, camera cuts, the framing and the characters movements. Although more detailed, our pipeline is similar to the general five-stage pro-

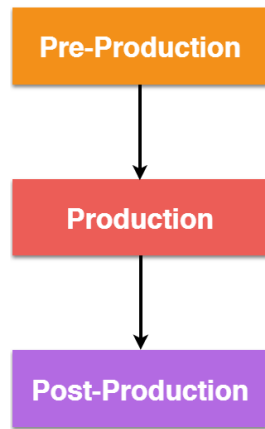


Figure 1: The general film production pipeline is composed by three fundamental steps: Pre-Production, where the design of the film and its planning happens; The Production where the set building, props generation and filming happens; And the Post-Production, where the raw film is edited and visual effects, colouring, and sound are integrated to create the final film. See Figure 2 for the detailed diagram of our pipeline

cess proposed by Briggs et al. [2], and our film prototype stage is inspired by role-playing design [5] and the use of theatre [11] in the design process.

Inspired by Obrist et al. [12] work on olfactory experiences, we produced a design fiction film to design an in-car odour interface, presented in this paper as a case study. Obrist et al. [12] studied and classified in ten main categories experiences with smells based on the collection of 439 'smell stories' of everyday memorable experiences. As a starting point for our design fiction film we used those 'smell stories' that were relevant for the in-car context. Unfortunately, we can not provide details on the specifics of the envisaged technology based on olfactory experiences, as this research was part of an industry collaboration.

The Production Pipeline

Although at high level our pipeline for the production of design fiction films is similar to an industry-standard film production pipeline [6], shown in Figure 1, in closer detail our pipeline deviates from it. We emphasise the use of experiences classification as starting point of the pre-production step, followed by the identification of the lifestyle, the design of the characters and the script, whereas the industry-standard pipeline starts with the writing of the script and the character design and the design of their emotions are tasks that encompass different stages from scripting to storyboarding. Our pipeline also differs from industry-standard in the pre-visualisation stage as we replace the standard stage, which nowadays is computer generated [6], with a low-cost film prototype, inspired by role-playing design techniques [5], and shot using tools such as MAVIS [16] and iMovie for iPhone.

Pre-Production

The first stage, key for the pre-production phase, is to *classify the experiences* that can develop from the specific interaction. In our case the interaction based on the sense of smell. We analysed the categories on olfactory experiences identified by Obrist et al [12], focusing on the stories containing car experiences, and identified two main categories, Category 3: Smell perceived as stimulating; Category 9: Smell changes mood, attitude, behaviour. These experiences guide the design of the film. The *lifestyle* and social interactions relevant for the envisioned in-car experience are extrapolated from them and from other considerations on the target users, which were received from the industry partner. The lifestyle and the experiences are used in the *design of the fictional characters* for the film including their background, their personality, and their relationships with each other and the environment in which they live.

Once the fictional characters are designed the *script* can be written based on the characters, their lifestyle, and their need for the technology. The script contains the dialogue and tone, i.e. the way it is performed, a description of the locations, the props, and the sets. The dialogue and tone are particularly significant as they help the audience empathise with the characters. From the script three elements are identified for later stages: *the initial locations, the initial set design, and the general technology functionalities*. The script is then transformed into a *storyboard* and evaluated. The *evaluation* is conducted internally within the design team, consisting of a domain expert, two media production experts, and a creative designer. This initial evaluation is designed to ensure the story outlined in the storyboard fits with the lifestyle, the effect of the technology on said lifestyle, and most importantly, the experiences that the film communicates to the audience. It is also an assessment on how the story is conveyed by the visuals. Evaluating these

elements generates new ideas and identifies potential gaps in the stages completed so far.

Figure 2 depicts the pre-production as a linear process using solid lines, with small dotted lines going back to previous stages. The dotted lines are to be read as follows. Consider each stage carefully before declaring it complete and starting the next one. Do not modify a stage already completed before reaching the evaluation stage unless a major problem is detected.

Prototyping and Production

In this phase a *film prototype* is produced (see Figure 3). A film prototype is a low cost version of the film, produced quickly from the storyboard and the script. This prototype is shot using low cost tools, for instance we used MAVIS [16] an iPhone app designed for professional film-making, and iMovie, replacing actors with the design team, and without the final sets or props. In addition to help exploring and planning the shots, the framing, the mood, the locations for the final film, and understanding which scenes need to be shot on location and which are better shot in a studio, the film prototype influences the design of the technology as it is in essence a filmed role-playing design exercise with the additional purpose of guiding the film production.

Once the film prototype is generated a *small expert group* is involved for evaluation. In addition to ask the standard questions regarding the production of the film, such as: Do the cuts between shots work with each other, are they fluid or jittery? Does the story make sense using the shot, the focus of attention, the set and the locations we choose? Is the shot focused on the right elements? Does it convey the correct message? The group should focus on answering the questions: Is it clear how the technology influences the lifestyle of the characters? Does the audience understand how the technology creates the experiences the designers

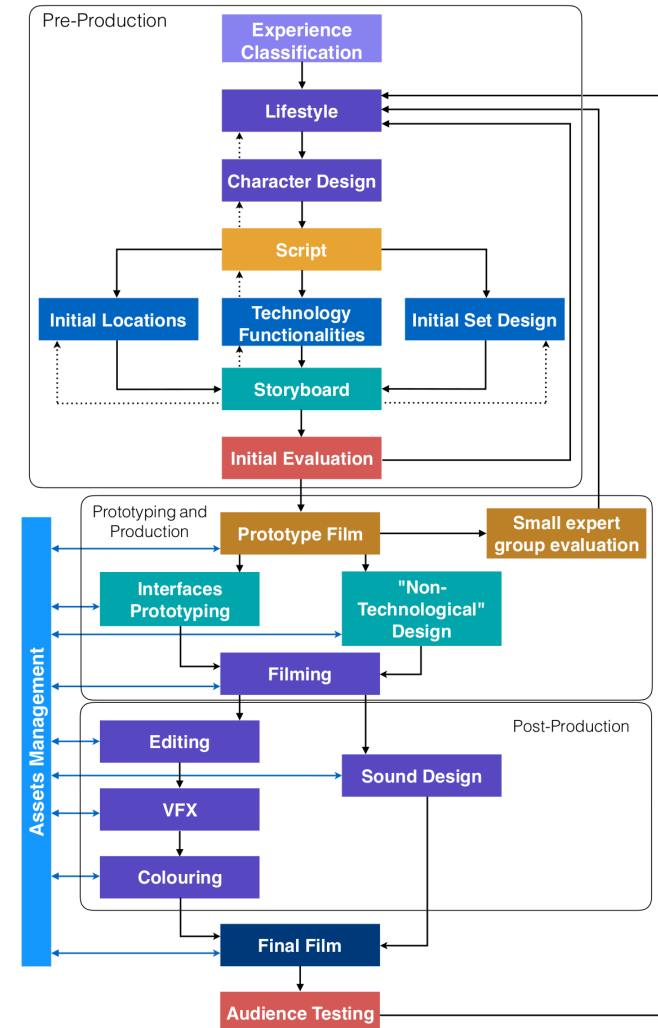


Figure 2: Diagram of the specific steps in our production pipeline for a design fiction film that conveys experiences of future technologies.



Figure 3: Scene from the design fiction film, where the main actor is drying the dog back at home. Top: scene when prototyping the scene with a bag in the office. Middle: wide shot of the studio where the scene was shot. Bottom: final scene in the film. Note how different the top and bottom scenes look. In the film prototype the dog is replaced by a bag, there is no set and the character is one of the design team members. However, the main element for the scene is there, the character sitting in front of a computer at his desk drying the dog.

extrapolated from the classification? The feedback from the group is collected and used for another iteration of the pre-production phase. This quick and dirty approach allows the collection of feedback and to start discussion early in the design of the fictional technology, the film prototype is easy to modify and many iterations can be generated containing time and costs.

Once the film prototype is acceptable the design and prototyping can begin. This phase consists of the *interface prototypes* and the *non-technological design*. The interface prototypes are designed after the film prototype is generated to avoid committing to a specific design too early in the generation of the film. The filming of the prototype also helps in understanding the interaction with the interfaces and at this point it is clear when, where, how and which part of the interface is visible and how it is used, so mock-ups can be produced. The non-technological design consists in designing the sets, costumes, props and all other elements necessary to produce the final version of the film. Once this is done the actual *filming* takes place using actors and the professional equipment.

Post-Production

The raw footage is put together in the *editing* phase (see Figure 2) reconstructing the story. Differently from the industry-standard editing process our editing is partially done during film prototyping. However, a selection process is required at this stage as multiple takes of the same shot might have been taken or some scenes might not be as good as initially thought. The takes and scenes that survive the selection are put together following the prototype, but the final edit might differ from it. To integrate the fictional technology into the film *visual effects (VFX)* are used, for instance by overlaying the interfaces on physical devices screens and adding the actors hands to simulate the interaction.

At this point *colouring*, which consists of colour correction and colour grading, takes place. Colour correction is done to create a consistent look throughout the film whereas colour grading is used to draw the audience into the film, give an artistic style to it, and direct the audience's attention to part of the image. The emotions are also crafted through the *sound design*, which is used throughout the film to set the mood. Sound design is developed in parallel to the VFX and colouring stages and after the editing, this is done because the sound design is independent from the VFX and colouring but the final edit is necessary so the correct emotions can be emphasised by the sound. Once all the stages are completed the final film is rendered and tested with the audience. The feedback from the audience is then used by the designers to mock-up the technology. Currently this last stage has not been completed, but we plan to do so in the near future.

Finally, Assets Management runs in parallel to the Prototyping and Production stage and to the Post-Production stage and it is key to use the pipeline efficiently. The bi-directional lines in Figure 2 mean that assets are produced, modified and used throughout the Production and Post-Production stages. When prototyping and producing the film terabytes of footage, graphics, visual effects files, colouring files, and sound files are produced. In addition, many props and structural elements for the stages are created, and cameras and lights need to be managed. A well organised file system, organised physical storage and a schedule for the use of the equipment and filming time are necessary for the success of the film production.

In the remainder of this paper practical considerations detailing the resources necessary for implementing our pipeline and future work will be discussed.

Practical Considerations

In terms of resources the implementation of our pipeline involved two to six people, depending on the stage, with complementary expertise in film production, editing, VFX, colouring, music composition, a creative assistant and an HCI researcher with expertise in olfactory experiences. We had access to a multi-camera film studio at the University which allowed us access to professional tools (such as professional cameras, lenses, lights, stabilisers, props, costumes and make up) and software (such as Keynote to prototype interfaces, MAVIS [16] and iMovie to produce the film prototype on the iPhone, Final Cut Pro to edit the raw footage, After Effects to produce the visual effects, DaVinci Resolve to colour and Logic Pro X to design the sound and music). Actors, dog and background actors were recruited, a car hired and we used various locations for shooting (for example the Brighton beach, a countryside village road, a garden and the multi-camera film studio).

The key in managing the production is to focus on the pre-production stages, planning carefully the film from the beginning. In fact, of the six months used to design and produce the film, four months were spent in the pre-production phase, one month was used for prototyping and production, and one for the post-production.

Discussion and Future Work

Considering that using film as a design tool presents a lot of challenges and requires specialised expertise, skills, and substantial resources, why should we in HCI bother about it? The HCI community is dealing with the exploration of future technologies and interaction modalities and it is not always clear if we are heading in the right direction. While making prototypes is not always the right approach to model a challenging interaction, especially for olfactory

experiences, focusing on experiences and conveying experiences through film seems appropriate.

In contrast with visual interfaces, smells are challenging to film as they can not be filmed directly, only the characters' reactions to them can show what kind of odour they are experiencing. By focusing our pre-production on the experiences and the characters design rather than on the technology itself we were able to achieve this, the film prototype was key in understanding when and how the experience come through and whether it is clear that it is linked to a change in smell inside the car. Unfortunately no further details on the film content itself can be given due to confidentiality, however we hope that the pipeline presented will help researchers in making design fiction films that convey the experiences elicited by the technology under design.

Although our film is fictional, the experiences shown in it are inspired by real people's experiences and conveys the idea of a 'day in the life of a couple' so that it feels as though the olfactory experiences are integrated into the characters' lives. In conclusion, our approach requires a great deal of commitment on the part of the design team as they are asked to learn the process of film-making by working with the film producer at every stage of the film. However, we believe that as films are becoming a common design tool these skills are necessary.

Acknowledgements

We would like to give our special thanks to Mr Matthew Martin for his assistance during filming, Mr Marc Williams and Miss Shelley Clayton for being our main actors, Dr Kate Howland, Miss Natasha Popoola, Mr Mikey Harrison for agreeing to be our secondary actors, Mr Marc Rahman for kindly letting us using his house as filming location and to Mrs Ruth Brownbridge for letting us using her dog Sam.

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